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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/671,201	09/28/2000	Michiaki Sano	07553.0009	9091

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EXAMINER
VINH, LAN

ART UNIT	PAPER NUMBER
1765	9

DATE MAILED: 10/03/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/671,201	SANO, MICHIAKI	
	Examiner	Art Unit	
	Lan Vinh	1765	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 September 2002* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *10-28,32-34 and 36-40* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *10-28,32-34 and 36-40* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☒ Certified copies of the priority documents have been received in Application No. *09/671201* .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

1. The finality of the previous office action (paper no. 7) has been withdrawn. The applicants only have to respond to the following non-final rejection.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> **A person shall be entitled to a patent unless –**
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 32-34 are rejected under 35 U.S.C. 102(b) as being anticipated by Berglund et al (US 5,250,165)

Berglund discloses a method for isotropically reactive ion etching a contact. This method comprises the steps of:

etching the film 23 by using a mask layer/photoresist film 24 as a mask (col 5, lines 26-28; fig. 2)

one the etching is completed, removing by etching/ashing the film 23 with a shunted bias power level to highly isotropically etch through the resist film 23, fig. 3 of Berglund shows that the etching step etches through halfway of resist film 23 (col 5, lines 31-54). This reads on ashing the film with a first biasing power level substantially halfway through the resist film after etching

The total silence of Berglund about applying a second bias power level after ashing with the shunted bias/first biasing power level reads on applying a second biasing power level equal to zero after ashing with the first biasing power level.

Regarding claims 33-34, Berglund discloses using the photoresist film 24 as a mask to form a specific pattern at a silicon dioxide/organic film formed on the substrate/workpiece (col 5, lines 11-13)

4. Claims 18-28, 38-40 are rejected under 35 U.S.C. 102(e) as being anticipated by Yang (US 6,218,084)

Yang discloses a method for removing photoresist formed at a substrate/workpiece 200 having a portion 206 around the opening of the hole /fence portion placed in a plasma chamber. This method comprises the steps of:

etching the substrate/workpiece to form an opening (col 3,lines 3-5)

applying high-frequency bias power to the wafer/substrate at a first power level (300 W) to strip/remove portion 206 formed during etching (col 3, lines 37-42)

generating/raising the processing gas to a plasma (col 3, lines 36-40)

eliminating the high frequency bias power before removing the photoresist completely (col 3, lines 43-45) reads on stopping the application of the high frequency bias power before removing the photoresist completely

using the same processing gas of oxygen/addtional gas before and after stopping the application of bias power (col 3, lines 18-41)

The limitation of claim 22 has been discussed above.

Regarding claim 23, Yang discloses reducing the bias power level to remove the portion 206/fence portion (col 3, lines 44-45)

Regarding claims 19-20, 24-25, 27-28, 39-40, Yang discloses using photoresist layer 204 as a mask to form a pattern at a dielectric (silicon dioxide) layer 202/ organic film on the substrate (col 2, lines 3-5; fig. 2A)

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 10-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yang et al (US 6,218,084) in view of Nguyen et al (US 6,043,164)

Yang discloses a method for removing photoresist formed at a substrate/workpiece 200 having a portion 206 around the opening of the hole /fence portion placed in a plasma chamber. This method comprises the steps of:

etching the substrate/workpiece to form an opening (col 3,lines 3-5)

applying high-frequency bias power to the wafer/substrate at a first power level (300 W) to strip/remove portion 206 formed during etching (col 3, lines 37-42)

generating/raising the processing gas to a plasma (col 3, lines 36-40)

reducing the high-frequency bias power to the wafer/substrate before completely removing the photoresist (col 3, lines 43-45)

Unlike the instant claimed inventions as per claims 10, 15, Yang does not specifically disclose switching the high-frequency bias power from the first power level to a lower second power level although Yang discloses reducing the high-frequency bias power.

However, Nguyen discloses a method for transferring a multilevel photoresist pattern comprises the step of reducing/ switching the high-frequency bias power from the first power level to a lower second power level before removing the photoresist completely (col 12, lines 14-20)

Since Yang discloses reducing the high-frequency bias power one skilled in the art would have found it obvious to modify Yang by reducing/ switching Yang's high-frequency bias power from the first power level to a lower second power level as per Nguyen because Nguyen states that during the step of lowering the bias power the resist covering the dielectric is completely removed (col 12, lines 17-21)

The limitation of claims 11-12 has been discussed above.

Regarding claims 13-14, 16-17, Yang discloses using photoresist 204 as a mask to form a pattern at a dielectric (silicon dioxide) layer 202/ organic film on the substrate (col 2, lines 3-5; fig. 2A)

Response to Arguments

7. Applicant's arguments with respect to claims 32-34 have been considered but are moot in view of the new ground(s) of rejection.

However, applicant's arguments with respect to claims 18-28, 38-40, 10-17 have been fully considered but they are not persuasive.

The applicants argue that Yang does not disclose " stopping application of the high-frequency power for biasing before the photoresist film becomes completely removed " because the examiner has misinterpreted the passage of " the bias power applied on the wafer can be reduced, and even eliminated " in Yang since this passage merely suggests that the bias power applied on the wafer can be reduced , and even eliminated from the conventional higher bias power. The examiner disagrees because as recited in col 3, lines 38-46 of Yang, Yang clearly discloses applying a high frequency bias power on a wafer and " the bias power applied on the wafer can be reduced, and even eliminated" in a subsequent step to remove the photoresist film . Therefore, the examiner asserts that Yang discloses the step of " stopping application of the high-frequency power for biasing before the photoresist film becomes completely removed " as recited in claims 18, 21, 26.

In response to applicant's argument that there is no suggestion/motivation to combine the references of Yang and Nguyen, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge

generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case since the motivation to combine the references comes from Nguyen (paragraph 6 of the office action), one skilled in the art would have found it obvious to incorporate Nguyen teaching into Yang method to produce the claimed invention.

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lan Vinh whose telephone number is 703 305-6302. The examiner can normally be reached on M-F 8:30-5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Benjamin Utech can be reached on 703 308-3836. The fax phone numbers for the organization where this application or proceeding is assigned are 703 872-9310 for regular communications and 703 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 308-0661.

BENJAMIN L. UTECH
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700

LV
September 29, 2002